

## THE LIFE HISTORY OF *ZIZULA HYLAX ATTENUATA* (T.P. LUCAS) (LEPIDOPTERA: LYCAENIDAE)

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### Abstract

The early stages of *Zizula hylax attenuata* are described and illustrated from north-eastern Queensland. Larvae feed on the young fruits of *Hygrophila angustifolia* (Acanthaceae), a small erect herb growing in paperbark swampland habitats. Larvae are not attended by ants.

### Introduction

*Zizula hylax attenuata* occurs widely along the east coast of Australia, from central New South Wales to Torres Strait (Common and Waterhouse 1981, Dunn and Dunn 1991). It is also recorded from the Northern Territory, and an isolated population apparently occurs in central Australia near the Macdonnell Ranges west of Alice Springs (Pfitzner and Fargher 1976). The life history of the African subspecies *Z. h. gaitera* Trimen was illustrated by Clark and Dickson (1971), but there is no description of the Australian subspecies. Sankowsky (1991) listed *Hygrophila angustifolia* R.Br. (Acanthaceae) as a larval food plant from a *Melaleuca* swamp near Tolga on the Atherton Tablelands in March 1985. More recently Braby (1992) recorded the early stages of the butterfly on the same plant in the coastal paperbark swamplands near Cardwell, north-eastern Queensland, and provided brief notes on egg-laying sites and pupal habits. The following description of the life history was made chiefly from material collected from a lowland swampland site 12 km NW of Rollingstone, approximately 65 km NW of Townsville, on 24.iv.1993.

### Life history

**Egg** (Fig. 1). White; mandarin-shaped, with irregular pattern of fine ridges; 0.4 mm dia. x 0.15 mm high.

**First instar larva**. Body very pale grey-brown, with faint pinkish lateral line; thorax and abdomen with dark brown primary setae on dorsal and lateral surface; head capsule light brown. Final length 1.5 mm.

**Final instar larva** (Fig. 2). Body light green, with conspicuous dark red middorsal line stretching from prothorax to abdominal segment 10, one or two faint white or pinkish-white subdorsal lines; each segment with numerous short colourless setae; prothorax with pink transverse band anteriorly; abdominal segments 7-10 with dark red lateral line edged below white. Head capsule pale yellow-brown, hidden beneath prothorax. Spiracles light brown. Dorsal nectary organ (Newcomer's organ) present on abdominal segment 7. Eversible tentacular organs not visible. Length 7 mm, width 2 mm.

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*Pupa* (Figs. 3, 4). Elongate, with numerous colourless setae up to 0.4 mm long; head and thorax dull green; abdomen lighter green, with faint dark green middorsal line; abdominal segment 1 with two conspicuous black spots. Attached by anal hooks and a central girdle. Length 6.0-7.0 mm, width 2.0 mm.

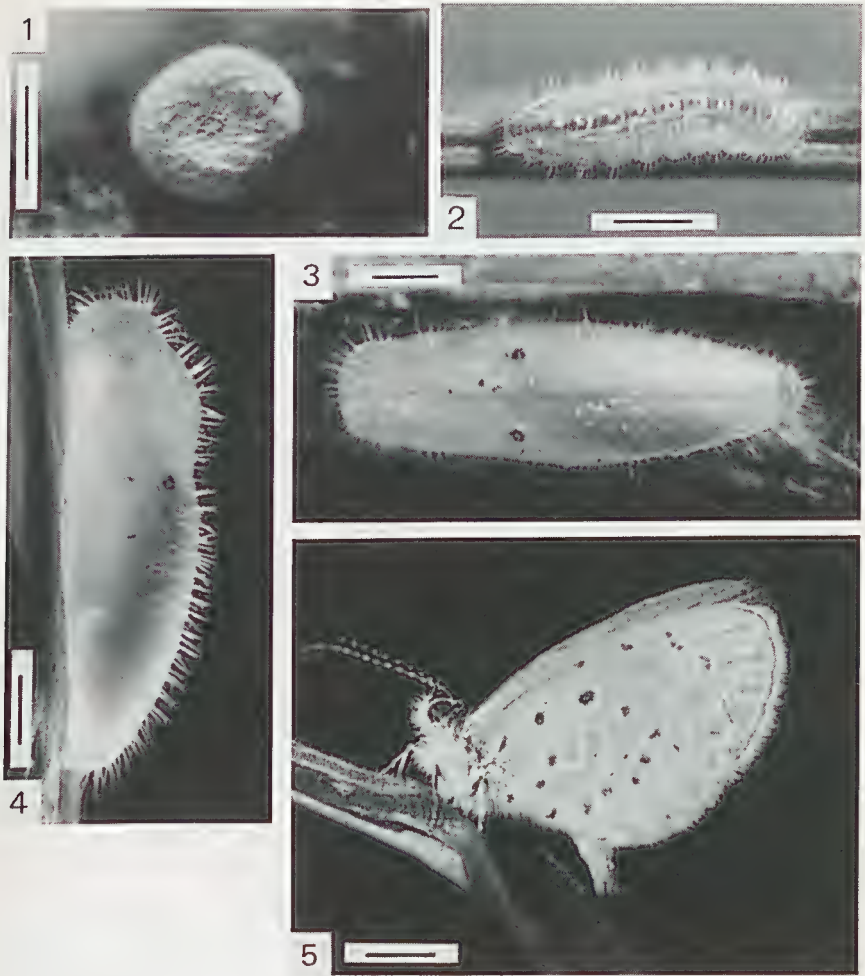
### Discussion

Eggs are laid singly on the bracts of the food plant *Hygrophila angustifolia*. Early instar larvae do not eat the egg shell, and after emergence appear to burrow inside the calyx of the developing fruits after flowering. Later instars are found feeding either internally or externally on the young fruits, and are not attended by ants. The larvae closely resemble the greenish colouration of the bracts, and they can be detected by the presence of frass around a small exit hole on the developing fruit. Pupae and pupal exuviae have only been located on the stem and beneath leaves of the food plant, suggesting larvae leave the fruits to pupate. In captivity, the pupal duration was eight days.

The early stages of *Z. hylax* in Australia are structurally very similar to those illustrated by Clark and Dickson (1971) for the species in South Africa. However, the South African race differs from *attenuata* in that the final instar larva lacks the prominent dark red middorsal line, and the two black spots on the pupa are less conspicuous.

Larvae of *Z. hylax* are similar in general appearance to other small Australian lycaenids, viz. *Freyeria trochylus putli* (Kollar), *Famegana alsulus alsulus* (Herrich-Schaffer), *Zizeeria karsandra* (Moore) and *Zizina labradus* (Godart), but may be distinguished by the red dorsal line, usually not present in the other species. Larvae of these other lycaenids also do not feed on *Hygrophila* or indeed on any members of the Acanthaceae (Common and Waterhouse 1981, Dunn and Dunn 1991). The only other Australian butterfly which utilises *H. angustifolia* in the larval stage is *Junonia hedonia zelima* (Fabricius) (Sankowsky 1975, Braby 1992). The larvae of this nymphalid, however, feed only on the foliage.

At both Rollingstone and Cardwell, the food plant is very patchy in extent and grows, as a small erect herb, in the lowland *Melaleuca viridiflora* woodlands which are very swampy: in the wet season the plant typically occurs in deep (30 cm) pools of water. Adults of *Z. hylax* (Fig. 5) are local but not necessarily found breeding in the same area each season. They fly slowly over low vegetation near the surface of the pools of water, usually close to the food plant, and frequently settle on the stems and leaves of sedges, grasses etc. We have not followed the complete life cycle, but adults are generally more abundant in March-May during, or after, the wet season when *H. angustifolia* flowers. Only one specimen has been taken late in the dry season; a freshly emerged female was collected at Cardwell on 17.x.1992 after a brief period of rainfall. In the dry season we have noticed that the food plant usually withers and dries up so that little foliage or fruit remain.



**Figs 1-5.** Life history of *Zizula hylax attenuata*: (1) egg, dorsal view; (2) final instar larva; (3) pupa, dorsal view; (4) pupa, lateral view; (5) adult male, underside. Scale = 0.2 mm for Fig. 1; 1.0 mm for Figs 2-4; 2.0 mm for Fig. 5.

Hence, the phenology of *Z. hylax* may be tightly limited to the seasonal availability of fruits of *H. angustifolia* and the butterfly may diapause, as occurs in the larval stage of another tropical-subtropical lycaenid *Everes lacturnus australis* Couchman (Samson 1991). Alternatively, it is possible that *Z. hylax* in Australia switches to another food during the dry months: Clark and Dickson (1971) and Larsen (1991) recorded in Africa the early stages of *Z. hylax* on several species of plants in the Acanthaceae, but also on *Oxalis* (Oxalidaceae) and *Tribulus* (Zygophyllaceae).

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